

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-8 and 13-14 are pending in this application. Claims 1 and 5 are amended; and Claims 15 and 16 are canceled without prejudice or disclaimer by the present amendment. Support for the new and amended claims can be found in the original specification, claims and drawings.¹ No new matter is presented.

This amendment is submitted in accordance with 37 C.F.R. § 1.116, which after final rejection permits entering of amendments canceling claims, complying with any requirement of form expressly set forth in a previous Office Action or presenting the rejected claims in better form for consideration on appeal. The present amendment presents the rejected claims in better form for consideration on appeal by incorporating the features of Claims 15 and 16 into independent Claims 1 and 5, respectively. As the features incorporated into the pending independent claims were addressed in the previous Office Action, this amendment does not raise new issues requiring further consideration and/or search. It is therefore respectfully requested that the present amendment be entered under 37 C.F.R. § 1.116.

In the Office Action, Claims 1-8 and 13-16 are rejected under 35 U.S.C. § 103(a) as unpatentable over Rauschnabel et al. (WO 99/63129, herein Rauschnabel), citations from U.S. Pat. 6,613,393, in view of Ichihara et al. (U.S. Pat. 4,782,477, herein Ichihara) and Casey (U.S. Pat. 4,692,233).

In response to the rejections noted above, Applicant respectfully submits that amended independent Claims 1 and 5 recite novel features clearly not taught or rendered obvious over the applied references.

¹ E.g., specification at least at Figs. 1-2 and previously presented Claims 15 and 16.

Amended independent Claim 1, for example, is amended to incorporate the features of Claim 15 and recites, in part, a sputtering apparatus, wherein:

... the vacuum chamber includes a first film deposition area and a second film deposition area for deposition of a film on the substrate... and the vacuum chamber includes *a fifth exhaust port* on a first side wall of the vacuum chamber *between the first and second film deposition areas*, and *a sixth exhaust port* on a second side wall of the vacuum chamber *between the first and second film deposition areas*.

Independent Claim 5, while directed to an alternative embodiment, is amended to recite similar features. Accordingly, the remarks and arguments presented below are applicable to each of amended independent Claims 1 and 5.

As depicted in an exemplary embodiment at Figs. 1 and 2, the sputtering apparatus includes two exhaust ports 83, 84, which are disposed on side walls of the vacuum chamber between the first and second film deposition areas. As the first film deposition area and the second film deposition area carry out different reactions, the exhaust chamber (e.g. the area between the two exhaust ports 83, 84) has a low degree of pressure to separate the atmospheres of the two film deposition areas from one another. Thus, since the cylindrical substrate holder rotates within the vacuum chamber, the creation of this exhaust chamber via the two exhaust ports 83, 84 allows for a separation between the atmospheres of the two film depositions areas without using a physical partition.

In rejecting Claim 15, the Office Action relies on the Abstract and Fig. 2 of Casey and asserts that the reference teaches “using multiple vacuum pumps by placing a vacuum pump [30]-[32] per sub-chamber.” The Office Action then concedes that Casey “is limited in that it is not suggested to incorporate multiple vacuum pumps per sub-chamber,” but asserts that “it would have been obvious to one of ordinary skill in the art to place multiple vacuum pumps per sub-chamber for the predictable result of maintaining a vacuum, purity, and control of deposited material.”

As an initial matter, Applicant notes that Claim 15, as incorporated into Claim 1, recites that the vacuum chamber includes “a fifth exhaust port ... ***between the first and second film deposition areas***, and a sixth exhaust port ... ***between the first and second film deposition areas***.” Therefore, the exhaust ports are not included in each of the sub-chambers (e.g. film deposition areas), as asserted in the Office Action, but are instead included ***between*** the film deposition areas. Therefore, the claims differ from Casey, and the Office Action’s modification of Casey, at least in this regard.

As described in the Abstract and Fig. 1 of Casey, each of the sub-chambers is separated by physical partitions 5-8. Further, Fig. 2 and col. 3, ll. 23-26 of Casey describes that each of the sub-chambers is pumped via respective exits in the wall of the chamber by its own individual vacuum pump 30-32. Therefore, since each of the respective sub-chambers in Casey are separated by physical partitions 5-8 and each are pumped by individual vacuum pumps it would not have been obvious to one of ordinary skill in the art to add exhaust ports between the sub-chambers, since each of the sub-chambers are physically partitioned from one another and include their own exhaust ports.

Furthermore, it is unclear how the configuration of Casey would allow for two exhaust ports to be located on different side walls of the chamber between a first and second sub-chamber. Due to the circular configuration of Casey it would be impossible for the chamber to include “a fifth exhaust port ***on a first side wall of the vacuum chamber*** between the first and second film deposition areas, and a sixth exhaust port ***on a second side wall of the vacuum chamber*** between the first and second film deposition areas.” Since the chamber in Casey is circular there is only one outer wall, and if the partitions 5-8 were removed it would be possible only to place one exhaust port on the outer wall between the sub-chambers, not two.

Additionally, as a basis for the finding of obviousness, the Office Action cites *In re Harza* and notes that “[i]t has been held that a mere duplication of parts has no patentable significance unless a new and unexpected result is produced.” As noted above, however, the configuration recited in amended Claim 1 of providing a plurality of exhaust ports between the first and second film deposition areas results in the creation of an exhaust chamber in the area between the two exhaust ports, thus resulting in a separation of the atmospheres between the first and second film deposition areas. Such a configuration is, therefore, not a mere duplication of parts, but instead is used to provide a separation between the first and second film deposition areas without implementing a physical partition between the first and second film deposition areas.

Further, neither Rauschnabel nor Ichihara are relied upon to reject the above noted claimed feature, and Applicant respectfully submits that neither of these references cure the above noted deficiencies of Casey. Therefore, Rauschnabel, Ichihara and Casey, neither alone, nor in combination, teach a “vacuum chamber [that] includes ***a fifth exhaust port*** on a first side wall of the vacuum chamber ***between the first and second film deposition areas***, and ***a sixth exhaust port*** on a second side wall of the vacuum chamber ***between the first and second film deposition areas***,” along with all the additional limitations recited in amended independent Claims 1 and 5.

Accordingly, Applicant respectfully requests that the rejection of Claims 1 and 5 (and Claims 2-4, 5-8, and 13-14, which depend therefrom) under 35 U.S.C. § 103 be withdrawn.

Consequently, in view of the present amendment and light of the foregoing comments, it is respectfully submitted that the invention defined by Claims 1-8 and 13-14 is patentably distinguishing over the applied references. The present application is therefore believed to be in condition for formal allowance and an early and favorable reconsideration of the application is therefore requested.

Respectfully submitted,

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